

CLAIMS:

1. (previously presented) A decoding process comprising:
 - receiving a block of coefficients relating to a block of video information to be displayed which has been transformed and quantized for compression of the video information;
 - providing a single look-up table (LUT) which consists of a single group of scaling factors applicable for scaling of coefficients of different block sizes;
 - computing an index for each coefficient, the index being a function of a quantization parameter, a size of the block of coefficients, and a position of said each coefficient within the block;
 - indexing the LUT, using the computed index, to determine a scaling factor in the LUT applicable for scaling of said each coefficient, wherein indexing is independent of a size of the block;
 - scaling the block of received coefficients, using the determined scaling factors, to inversely quantize the block of received coefficients; and
 - inversely transform the block of scaled coefficients in order to reconstruct a signal of the block of video information for display of the video signal.
2. (previously presented) The decoding process defined in Claim 1 wherein the index is the sum of a modulo from the quantization parameter and a first value determined by block size of the block of coefficients and the position of said each coefficient within the block.
3. (original) The decoding process defined in Claim 2 wherein the first value is the sum of a second value determined by the vertical size of the block and the vertical position of said each coefficient within the block and a third value determined by the horizontal size of the block and the horizontal position of said each coefficient within the block.
4. (original) The decoding process defined in Claim 3 wherein the block size is one selected from a group that consists of 4x4, 4x8, 8x4 and 8x8.
5. (canceled)
6. (original) The decoding process defined in Claim 1 further comprising:

determining an offset of an array according to the position of said each coefficient;
determining an inverse quantization value for said each coefficient based on the offset.

7. (original) The decoding process defined in Claim 6 wherein entries of the array are of a form $\text{pow}(2, (k+O)/12)$, where k represents a position of an individual entry in the array and O is a constant.

8. (original) The decoding process defined in Claim 6 wherein the array is a 1-dimensional (1-D).

9. (previously presented) The decoding process defined in Claim 1 wherein inversely transform the block of scaled coefficients comprises:

applying a vertical transform to the block of scaled coefficients; and
applying a horizontal transform to block of scaled coefficients.

10. (previously presented) The decoding process defined in Claim 1 wherein the basis vectors of the transform are:

1	1	1	1	1	1	1	1
12/8	10/8	6/8	3/8	-3/8	-6/8	-10/8	-12/8
1	1/2	-1/2	-1	-1	-1/2	1/2	1
10/8	-3/8	-12/8	-6/8	6/8	12/8	3/8	-10/8
1	-1	-1	1	1	-1	-1	1
6/8	-12/8	3/8	10/8	-10/8	-3/8	12/8	-6/8
1/2	-1	1	-1/2	-1/2	1	-1	1/2
3/8	-6/8	10/8	-12/8	12/8	-10/8	6/8	-3/8

or multiples thereof or a transform thereof, and represent an 8-point transform used for blocks that have one or both of horizontal and vertical size of 8.

11. (previously presented) The decoding process defined in Claim 1 wherein inversely transform the block of scaled coefficients comprises computing the inverse transform using only a sequence of addition, subtraction, and shift operations.

12. (original) The decoding process defined in Claim 1 wherein the block size is one selected from a group that consists of 4x4, 4x8, 8x4 and 8x8.

13. (previously presented) A computer-implemented decoder for decoding a block of coefficients relating to a block of video information to be displayed which has been transformed and quantized for compression of the video information, the decoder comprising:

a memory which stores a single look-up table (LUT) which consists of a single group of scaling factors applicable for scaling of coefficients of different block sizes;

an index calculator configured to compute an index for each coefficient, the index being a function of a quantization parameter, a size of the block of coefficients, and a position of said each coefficient within the block;

an indexer configured to index the LUT, using the computed index, to determine a scaling factor in the LUT applicable for scaling of said each coefficient, wherein indexing is independent of a size of the block;

a scaler configured to scale the block of received coefficients, using the determined scaling factors, to inversely quantize the block of received coefficients; and

an inverse transformer configured to inversely transform the block of scaled coefficients in order to reconstruct a signal of the block of video information for display of the video signal.

14. (previously presented) The decoder defined in Claim 13 wherein the index is the sum of a modulo from the quantization parameter and a first value determined by block size of the block of coefficients and the position of said each coefficient within the block.

15. (original) The decoder defined in Claim 14 wherein the first value is the sum of a second value determined by the vertical size of the block and the vertical position of said each coefficient within the block and a third value determined by the horizontal size of the block and the horizontal position of said each coefficient within the block.

16. (original) The decoder defined in Claim 15 wherein the block size is one selected from a group that consists of 4x4, 4x8, 8x4 and 8x8.

17. (canceled)

18. (previously presented) The decoder defined in Claim 13 wherein the scaler scales the block of received coefficients using a scaling factor by

determining an offset of an array according to the position of said each coefficient;

determining an inverse quantization value for said each coefficient based on the offset.

19. (original) The decoder defined in Claim 18 wherein entries of the array are of a form $\text{pow}(2, (k+O)/12)$, where k represents a position of an individual entry in the array and O is a constant.

20. (original) The decoder defined in Claim 18 wherein the array is a 1-dimensional (1-D).

21. (previously presented) The decoder defined in Claim 13 wherein the inverse transformer inversely transforms the block of scaled coefficients by
applying a vertical transform to the block of scaled coefficients; and
applying a horizontal transform to block of scaled coefficients.

22. (previously presented) The decoder defined in Claim 13 wherein the basis vectors of the inverse transform are:

1	1	1	1	1	1	1	1
12/8	10/8	6/8	3/8	-3/8	-6/8	-10/8	-12/8
1	1/2	-1/2	-1	-1	-1/2	1/2	1
10/8	-3/8	-12/8	-6/8	6/8	12/8	3/8	-10/8
1	-1	-1	1	1	-1	-1	1
6/8	-12/8	3/8	10/8	-10/8	-3/8	12/8	-6/8
1/2	-1	1	-1/2	-1/2	1	-1	1/2
3/8	-6/8	10/8	-12/8	12/8	-10/8	6/8	-3/8

or multiples thereof or a transform thereof, and represent an 8-point transform used for blocks that have one or both of horizontal and vertical size of 8.

23. (previously presented) The decoder defined in Claim 13 wherein the inverse transformer computes the inverse transform using only a sequence of addition, subtraction, and shift operations.

24. (original) The decoder defined in Claim 13 wherein the block size is one selected from a group that consists of 4x4, 4x8, 8x4 and 8x8.

25. (previously presented) A computer-readable medium storing instructions which, when executed by a system, cause the system to:

receive a block of coefficients relating to a block of video information to be displayed which has been transformed and quantized for compression of the video information;

provide a single look-up table (LUT) which consists of a single group of scaling factors applicable for scaling of coefficients of different block sizes;

compute an index for each coefficient, the index being a function of a quantization parameter, a size of the block of coefficients, and a position of said each coefficient within the block;

index the LUT, using the computed index, to determine a scaling factor in the LUT applicable for scaling of said each coefficient, wherein indexing is independent of a size of the block;

scale the block of received coefficients, using the determined scaling factors, to inversely quantize the block of received coefficients; and

inversely transform the block of scaled coefficients in order to reconstruct a signal of the block of video information for display of the video signal.

26. (previously presented) The computer-readable medium defined in Claim 25 wherein the index is the sum of a modulo from the quantization parameter and a first value determined by block size of the block of coefficients and the position of said each coefficient within the block.

27. (previously presented) The computer-readable medium defined in Claim 26 wherein the first value is the sum of a second value determined by the vertical size of the block and the vertical position of said each coefficient within the block and a third value determined by the horizontal size of the block and the horizontal position of said each coefficient within the block.

28. (previously presented) The computer-readable medium defined in Claim 25 wherein the block size is one selected from a group that consists of 4x4, 4x8, 8x4 and 8x8.

29. (canceled)

30. (previously presented) A decoding apparatus for decoding a block of coefficients relating to a block of video information to be displayed which has been transformed and quantized for compression of the video information, decoding apparatus comprising:

means for storing a single look-up table (LUT) which consists of a single group of scaling factors selectively applicable for scaling of coefficients of different block sizes;

means for computing an index for each coefficient, the index being a function of a quantization parameter, a size of the block of coefficients, and a position of said each coefficient within the block;

means for indexing the LUT, using the computed index, to determine a scaling factor in the LUT applicable for scaling of said each coefficient, wherein indexing is independent of a size of the block;

means for scaling the block of received coefficients, using the determined scaling factors, to inversely quantize the block of received coefficients; and

means for inversely transforming the block of scaled coefficients in order to reconstruct a signal of the block of video information for display of the video signal.

31. (previously presented) A decoding process comprising:

receiving a block of coefficients relating to a block of video information to be displayed which has been transformed and quantized for compression of the video information;

providing a single look-up table (LUT) which consists of a group of scaling factors applicable for scaling of coefficients of different block sizes;

computing an index for each coefficient, the index being a function of a quantization parameter, a size of the block of coefficients, and a position of said each coefficient within the block;

indexing the LUT, using the computed index, to determine a scaling factor in the LUT applicable for scaling of said each coefficient, wherein indexing is independent of a size of the block;

scaling the block of received coefficients, using the determined scaling factors, to inversely quantize the block of received coefficients; and

applying a vertical transform and a horizontal transform to the block of scaled coefficient, in order to reconstruct a signal of the block of video information for display of the video signal, wherein basis vectors of the vertical and horizontal transforms are

1	1	1	1	1	1	1	1
12/8	10/8	6/8	3/8	-3/8	-6/8	-10/8	-12/8
1	1/2	-1/2	-1	-1	-1/2	1/2	1
10/8	-3/8	-12/8	-6/8	6/8	12/8	3/8	-10/8
1	-1	-1	1	1	-1	-1	1
6/8	-12/8	3/8	10/8	-10/8	-3/8	12/8	-6/8
1/2	-1	1	-1/2	-1/2	1	-1	1/2
3/8	-6/8	10/8	-12/8	12/8	-10/8	6/8	-3/8

or multiples thereof or a transform thereof.

32. (previously presented) The decoding process defined in Claim 31 wherein the index is a sum of a modulo from the quantization parameter, a first value determined by a vertical position of said each coefficient within the block and a second value determined by a horizontal position of said each coefficient within the block.

33. (original) The decoding process defined in Claim 31 wherein applying the transform comprises computing the transform using only a sequence of addition, subtraction and shift operations.

34. (original) The decoding process defined in Claim 31 wherein the block size is one selected from a group that consists of 4x4, 4x8, 8x4 and 8x8.

35-36. (cancel)

37. (previously presented) A computer-implemented decoder for decoding a block of coefficients relating to a block of video information to be displayed which has been transformed and quantized for compression of the video information, the decoder comprising:

a memory which stores a single look-up table (LUT) which consists of a group of scaling factors applicable for scaling of coefficients of different block sizes;

an index calculator configured to compute an index for each coefficient, the index being a function of a quantization parameter, a size of the block of coefficients, and a position of said each coefficient within the block;

an indexer configured to index the LUT, using the computed index, to determine a scaling factor in the LUT applicable for scaling of said each coefficient, wherein indexing is independent of a size of the block;

a scaler configured to scale the block of received coefficients, using the determined scaling factors, to inversely quantize the block of received coefficients; and

an inverse transformer to apply a vertical transform and a horizontal transform to the block of scaled coefficients in order to reconstruct a signal of the block of video information for display of the video signal, wherein basis vectors of the vertical and horizontal transforms are

1	1	1	1	1	1	1	1
12/8	10/8	6/8	3/8	-3/8	-6/8	-10/8	-12/8
1	1/2	-1/2	-1	-1	-1/2	1/2	1
10/8	-3/8	-12/8	-6/8	6/8	12/8	3/8	-10/8
1	-1	-1	1	1	-1	-1	1
6/8	-12/8	3/8	10/8	-10/8	-3/8	12/8	-6/8
1/2	-1	1	-1/2	-1/2	1	-1	1/2
3/8	-6/8	10/8	-12/8	12/8	-10/8	6/8	-3/8

or multiples thereof or a transform thereof.

38. (previously presented) The decoder defined in Claim 37 wherein the index is a sum of a modulo from the quantization parameter, a first value determined by a vertical position of said each coefficient within the block and a second value determined by a horizontal position of said each coefficient within the block.

39. (original) The decoder defined in Claim 37 wherein applying the transform comprises computing the transform using only a sequence of addition, subtraction and shift operations.

40. (cancelled)

41. (previously presented) A computer-readable medium storing instructions which, when executed by a system, cause the system to:

receive a block of coefficients relating to a block of video information to be displayed which has been transformed and quantized for compression of the video information;

provide a single look-up table (LUT) which consists of a single group of scaling factors applicable for scaling of coefficients of different block sizes;

compute an index for each coefficient, the index being a function of a quantization parameter, a size of the block of coefficients, and a position of said each coefficient within the block;

index the LUT, using the computed index, to determine a scaling factor in the LUT applicable for scaling of said each coefficient, wherein indexing is independent of a size of the block;

scale the block of received coefficients, using the determined scaling factors, to inversely quantize the block of received coefficients; and

apply a vertical transform and a horizontal transform to the block of scaled coefficients, in order to reconstruct a signal of the block of video information for display of the video signal, wherein basis vectors of the vertical and horizontal transforms are

1	1	1	1	1	1	1	1
12/8	10/8	6/8	3/8	-3/8	-6/8	-10/8	-12/8
1	1/2	-1/2	-1	-1	-1/2	1/2	1
10/8	-3/8	-12/8	-6/8	6/8	12/8	3/8	-10/8
1	-1	-1	1	1	-1	-1	1
6/8	-12/8	3/8	10/8	-10/8	-3/8	12/8	-6/8
1/2	-1	1	-1/2	-1/2	1	-1	1/2
3/8	-6/8	10/8	-12/8	12/8	-10/8	6/8	-3/8

or multiples thereof or a transform thereof.

42. (previously presented) The computer-readable medium defined in Claim 41 wherein the index is a sum of the quantization parameter, a first value determined by a vertical position of said each coefficient within the block and a second value determined by a horizontal position of said each coefficient within the block.

43. (previously presented) The computer-readable medium defined in Claim 41 wherein instructions to cause the system to apply the transform comprise instructions which, when executed by the system, cause the system to compute the transform using only a sequence of addition, subtraction and shift operations.

44. (cancelled)

45. (previously presented) A decoder for decoding a block of coefficients relating to a block of video information to be displayed which has been transformed and quantized for compression of the video information, decoder comprising:

means for storing a single look-up table (LUT) which consists of a single group of scaling factors selectively applicable for scaling of coefficients of different block sizes;

means for computing an index for each coefficient, the index being a function of a quantization parameter, a size of the block of coefficients, and a position of said each coefficient within the block;

means for indexing the LUT, using the computed index, to determine a scaling factor in the LUT applicable for scaling of said each coefficient, wherein indexing is independent of a size of the block;

means for scaling a block of coefficients, using the determined scaling factors, to inversely quantize the block of received coefficients; and

means for applying a vertical transform and a horizontal transform to the block of scaled coefficients in order to reconstruct a signal of the block of video information for display of the video signal, wherein basis vectors of the vertical and horizontal transforms are

1	1	1	1	1	1	1	1
12/8	10/8	6/8	3/8	-3/8	-6/8	-10/8	-12/8
1	1/2	-1/2	-1	-1	-1/2	1/2	1
10/8	-3/8	-12/8	-6/8	6/8	12/8	3/8	-10/8
1	-1	-1	1	1	-1	-1	1
6/8	-12/8	3/8	10/8	-10/8	-3/8	12/8	-6/8
1/2	-1	-1	-1/2	-1/2	1	-1	1/2
3/8	-6/8	10/8	-12/8	12/8	-10/8	6/8	-3/8

or multiples thereof or a transform thereof.

46-64. (Canceled)